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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

PADGETT, MARIANNE L

ART UNIT	PAPER NUMBER
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1762

DATE MAILED: 04/17/2002

-19

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/374,344

Applicant(s)

Haya Kawa et al

Examiner

M.L. Padgett

Group Art Unit

1702

—The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address—

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- ☒ Responsive to communication(s) filed on 12/21/01
- ☐ This action is FINAL.
- ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- ☒ Claim(s) 301, 303 - 324 + 344 - 329 is/are pending in the application.
- Of the above claim(s) _____ is/are withdrawn from consideration.
- ☐ Claim(s) _____ is/are allowed.
- ☒ Claim(s) 301, 303 - 324, 314 - 329 is/are rejected.
- ☐ Claim(s) _____ is/are objected to.
- ☐ Claim(s) _____ are subject to restriction or election requirement

Application Papers

- ☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.
- ☐ The drawing(s) filed on _____ is/are objected to by the Examiner
- ☐ The specification is objected to by the Examiner.
- ? ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119 (a)-(d)

- ☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119 (a)-(d).

☐ All ☐ Some ☒ None of the:

- ☐ Certified copies of the priority documents have been received.
- ☐ Certified copies of the priority documents have been received in Application No. 08/933,886
- ☐ Copies of the certified copies of the priority documents have been received

in this national stage application from the International Bureau (PCT Rule 17.2(a))

? *Certified copies not received: PCT/JP96/00733 and 7 documents listed in paper #16 + declaration

Attachment(s)

- ☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 17
- ☐ Notice of Reference(s) Cited, PTO-892
- ☐ Notice of Draftsperson's Patent Drawing Review, PTO-948
- ☐ Interview Summary, PTO-413
- ☐ Notice of Informal Patent Application, PTO-152
- ☐ Other _____

Office Action Summary

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1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 12/21/01 has been entered.
2. The parent file (08/933,886) has been reviewed, and it is noted that Paper #7 therein states none of the certified priority documents has been received, final Office Action of paper #13 has no comment, nor does the Notice of Allowance (#16). Also the file contents (actual and listed) have no indication that the certified priority documents were ever filed with the PTO, however the examiner in the parent case did check the box indicating that the condition for 35 U.S.C. 119 priority claim (for the 7 priority documents) had been met.

The examiner further notes that the parent PCT/JP 96/00733 was claimed as basis for a CIP application in the application transmittal (p. 3 and p. 2 of added pages) while the Declarations of the parent and present case claim it as a foreign priority document for which a certified copy must be supplied by applicant for the conditions to be met. The examiner was advised that the amendment to the specification stating the parent is a CIP of the PCT is OK, and the priority should be treated the same as any continuation, which means the examiner is supposed to look in the PCT to see if the foreign priority documents are present (obviously impossible to do). A copy of the published PCT document would seem to the examiner to be a reasonable substitute.

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3. Claims 301-329 are objected to or rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 301 and 312, lines 3 and 4, respectively, "a composite" and "a surface" are objected to as being unclearly related to the same terms previously introduced in the preambles. Either proper articles for showing antecedent basis should be used, or clear differentiation provided.

In claim 308 and 320 it is unclear to the examiner how the photocatalytic material can effect water and contact angle on the surface if it is covered over by a protective layer, hence is no longer on the surface or in contact with any water that may be there.

Phrasing, such as "less thanⁿ about . . ." as used in claim 312, is objected to as being contradictory, because "about" includes amounts greater than the value given, while "less than" requires all values be below the same value. An alternative phrasing that avoids this ambiguity would be --less than or about--.

4. Applicant did not cite any support for their new claims 325-326 or 328-329, and while the phrasing "consisting essentially of . . ." was not found as used therein, it appears that the discussion of photocatalyst on p. 17 and the "Interleaved Silicone Layer" on p. 29 may be considered adequate support.

5. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible

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harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321© may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371© of this title before the invention thereof by the applicant for patent.

6. Claims 301, 303-312 & 314-329 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 54-58, 64-68, 71-72, 91-99 and 102-131 of U.S. Patent No. 6,013,372. Although the conflicting claims are not identical, they are not patentably distinct from each other because while wording of the claims are not

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identical, the patented claims contained limitations not included in the original application claims, such as ranges of contact angle with water, however such limitations have been added by amendment to the application, with all the concepts of the present claims embodied in these patent claims. Patent claims 54-56, 91, 93, 108, 119-121 and 131 explicitly set forth the contact angle with H₂O due to photocatalytic excitation with claims 94-96 discussing absorption of H₂O, however all the process application claims involve the photocatalyst, photoactivation and some sort of contact with water, or humidity which is water in vapor form, that inherently involves its adsorption on the treated surface, so the differences between the patent claims and independent claims 301 and 302 are only obvious variations, differences in order of claiming and overlapping scopes, hence it would have been obvious to one of ordinary skill in the art to generalize from the patent claims, as to the process being employed, to thus determine that generically water is being absorbed. Or alternately, the generic application claims encompass the specific patent claims. Note that while applicants' new dependent claims 324 to 327 include silica or silicone in the photocatalyst layer, or claims 326 or 329 use silica as a barrier layer, the patent claims 58, 64-68, 71-72, 97-98, 100, etc., use these materials as claimed. Patent claim 57 uses only a film of amorphous TiO₂, which meets the consisting essentially requirement of new claims 325-328, as it is equivalent to the support found in the specification for the "consisting essentially of" amendment. This rejection was not discussed by applicants' response.

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7. Claims 301, 303-306, 308-312, 314-318, 320-321, 323-324, 326 and 329 are rejected under 35 U.S.C. 103(a) as being unpatentable over Field et al alone, or in view of Hiroshi Okaniwa et al (translation).

In Field et al, see abstract, col. 1, lines 62-73, col. 2, lines 18-54; col. 3, lines 10-col. 4, lines 22 and especially col. 4, line 64-col. 5, line 55; etc. In the abstract, note that the film forming dispersion includes zinc oxide as the photoconductive material, a sensitization enhancing agent, such as a copper salt, and materials such as silicone. Suitable substrates including glass are discussed in col. 2, while col. 3, lists oxides of Zn, Ti, Sn and Bi as sensitive material, group I or IV (B) metals as enhancing, and col. 4 discusses silicone resins. Field et al teach use of UV (col. 5, line 43-55 and col. 6, lines 13-39) including exposures of 10-1000 ergs/cm². Aqueous (i.e. contain H₂O) development via processes that will be done in open air (air has humidity) are disclosed col. 5, lines 5-17 and col. 7+.

Note that it does not matter that Field et al's purpose is other than creating anti-fogging conditions, because the coating applied will inherently have these properties, given the deposition of claimed photoconductive material, which is subsequently exposed to UV sources, which are taught to make it hydrophillic (abstract), and the subsequent use subjects it to water or humidity as claimed. Nothing in the claimed process steps distinguish these claims nonobviously from Fields et al.

While Field et al teach making the surface hydrophillic, thus inherently effecting the contact angel with water so that the angles are small, no values therefore are disclosed and the

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PTO can not measure them, however as the requirement/teaching is for the surface to be able to tenaciously absorb water after exposure and to enable image development due to hydrophobic and hydrophilic areas, one of ordinary skill in the art would have used compositions in the process expected to produce contact angles as claimed in order for the imaging process to be effective as taught, i.e., wettability as claimed is needed.

Fields teaches use of UV light, but gives exposure ranges in units of total energy employed, not intensity as claimed, so exact comparison of these parameters is not possible with the information provided, however it would have been obvious to one of ordinary skill in the art to use a combination of times and intensities to produce the taught exposures, whose shorter times (i.e., second to a few minutes) would have been obvious for the economic advantages, hence would consequently have involved intensities as claimed.

It is further noticed, that surfaces that have been images or printed, and are expected to be used in high wear situations, are conventionally coated with protective layers, hence to do so for such end uses would have been obvious, especially as taught substrates, such as glass, are frequently used in such situation including as window on buildings or cars. Notice is also taken that the use of barrier layers an inexpensive glass, such as soda lime glass, is a conventional practice to prevent ion diffusion from contaminating layers deposited on the glass, hence use of such barrier coatings would have been obvious for this standard purpose.

Alternately, Hiroshi et al who also teach use of a photocatalytic metal oxide layer that is made hydrophilic with exposure to UV, are supportive of the above assertions concerning contact

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angles (see table 1 and 2 on pages 5 and 7), as well as ranges of useful UV intensity and times (page 3, line 12-20; page 4, lines 13-17 and tables), hence showing the further obviousness of the values claimed, due to the expected effectiveness of the parameters, and the expected results for the materials used.

In Hiroshi Okaniwa et al, the claim (p. 1); page 3, lines 1-7, 12-37; examples 1 and 2, particularly tables 1, 3 and 4, lines 13-18, plus p. 6 last paragraph, where the decrease in contact angle of water for the exposed areas, shows that the irradiation causes water molecules to be physically absorbed, including at angles of less than 20° and angles of 30° , which ranges are inclusive of almost 0° .

8. Claims 307, 319 and 322 are rejected under 35 U.S.C. 103(a) as being unpatentable over Field et al as applied to claims 301, 303-306, 308-312, 314-318, 320-321, 323-324, 326 & 329 above, and further in view of Ogawa et al (EPO 590,477), *optimally known to the Applicant*

Field et al teach the use of metals to enhance the sensitivity of the photocatalyst, teaching Cu, Bi, Cr, Ag, group I or IV metals, but does not indicate that Pt, Pd, Rh, Ru, Os or Ir are suitable for this purpose, however Ogawa et al (EPO-477), who is also teaching use of photocatalytic metal oxide of the same types as Field et al (i.e., TiO_2 , etc.), indicate that Pt (abstract) is also effective for improving photocatalytic activity. Col. 16, line 41 to col. 17, line 19 indicate that Pt, Pd, Ag and Ni all have equivalent use for the purpose taught in Field et al., therefore it would have been obvious to one of ordinary skill in the art to use metals, such as Pt or

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Pd (group VIII metals), as the sensitivity enhancing metals in Fields due to their demonstrated equivalence and expected effectiveness in like environments.

Hiroshi et al also supports the above asserted obviousness of uses on windows, i.e. architectural glass (abstract; col. 5-6), as well as showing usefulness on other claimed surfaces, such as tiles. Hiroshi has more discussion on possible UV or sunlight sources.

9. Claims 301, 305-307, 309, 312, 317-319, 324 and 327 are rejected under 35 U.S.C. 103(a) as being unpatentable over by Murasawa et al (823), alone or in view of Hiroshi Okaniwa et al.

In Murasawa et al, see the abstract; col. 3, lines 1-30 (silica and silicone) and 50-col. 4, line 27+ (TiO₂, ZnO, WO₃, SrTiO₃, optionally plus metals Pt, Pd, Ru, Rh, etc.), and 59-col. 5, line 18 (glass substrates and possible intervening (silica) layer) and lines 30-40; examples 3 and 4, and col. 8, lines 30-35 and 56-67 and col. 6, lines 16-30 (exposure to UV to photoexcite) for teachings of deposited layer containing claimed material that may be UV treated as claimed, hence would be inherently hydrophilic, i.e., have properties of wettability. Murasawa et al (823)'s intended use is in domestic applications, such as office walls (col. 1, line 60-65; col. 2, lines 55-60), thus exposure to atmospheric air that contains water (i.e. humidity) is inherent in the use of Murasawa et al's product, reading on the claims as written, which have no limit on the degree of H₂O exposure or where or how it occurs.

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The reasons for obviousness of the degree of contact angle as discussed above in Section 7, also apply to Murasawa et al, as like materials and process steps are involved. Applicant's intended use does not provide any criticality different step or requirement to the process.

10. Claims 301, 305-307, 309, 312, 317-319, 322, 324 and 327 are rejected under 35 U.S.C. 103(a) as being unpatentable over Heller et al, alone or in view of Hiroshi Okaniwa et al.

In Heller et al (5,616,532), see the abstract; col. 3, lines 1-54, esp. 36-47; col. 5-6, esp. col. 5, lines 56-67 and col. 6, lines 20-29; col. 7, lines 30-47; col. 8, lines 35-68+; col. 9, lines 13-25+; col. 11, lines 50-col. 12, line 45+; and col. 13, lines 7-59. Again 103 arguments are given in section 7 above are applicable for obviousness of contact angles, since the same photocatalyst as well as silica or silicone are used, plus co-catalytic metals Pd, Pt, Ru, Rh are options. In Heller et al's method of use (col. 11, line 50+), it is taught to use the photocatalytic-binder composition to render the surfaces it is applied to "virtually self-cleaning", and "to produce photoactive surfaces for the removal of contaminants from a fluid, e.g., air, water, and the like or from surfaces coated with the composition". Col. 12, lines 3-48 have UV and H₂O exposure as claimed. Heller et al need not discuss hydrophilicity induced by the photoexcitation, in order for it to occur. It is considered inherent, given like materials and conditions as claimed, with degrees for contact angles obvious as discussed previously.

11. Claims 301, 303-305, 309, 312, 313-317, 322, 325 and 328 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nissan Motor Co. LTD. (09-227157 or 09-227158) or Toyota Motor Corp. (Suzuki et al), alone or in view of Hiroshi et al as applied in Section 7).

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Note that these Japanese references have publication dates before the US Patent's filing date, but after the filing date of the PCT, of which the parent is a CIP, hence supplying a certified translation of the Japanese PCT, if it contains all the limitations of the rejected claims will remove these references as prior art.

The abstracts all teach non-fogging on glass or transparent substrates, via TiO_2 containing films, where the Nissan references may also contain an electroconductive metal oxide that may be SnO_2 or ZnO , hence also a photocatalyst, so these films meet the "consisting essentially of" requirement. While contact angles are not discussed in the abstracts, the same materials would have been expected to have like properties, or alternately Hiroshi et al provides reasonable expectation of claimed degrees, for reasons as discussed above. Note table on p. 6 or 7 of the Nissan reference may discuss contact angles, but a translation is not yet available.

12. The Japanese references Nakamura et al (Nissan); Kawagoe Hiroshi; Matsushita Elect. (1-288,321 and 09-173783) are equivalent to Fields, Hiroshi, Murasawa et al and Heller applied above.

13. Claims 301, 303-35, 309-312, 314-317, 321-323, 325-326, 328-329 are rejected under 35 U.S.C. 103(a) as being unpatentable over the literature article to Fukayama et al, alone or in view of Hiroshi Okaniwa et al as applied in section 7.

Fukayama et al deposit TiO_2 thin films on glass substrates, quartz, soda lime glass (SLG) and SiO_2 -precoated SLG (i.e. silica/SLG), where the TiO_2 is used as a photocatalyst, applicable for use in window glasses utilizing sunlight as well as room light. Fukayama et al's studies

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suggest the SiO_2 prevents or reduces diffusion of Na, hence is acting claimed (barrier layer behavior). The use of just TiO_2 reads on the claimed "consisting essentially of language of new claims 325 and 328. Fukayama et al intend their photocatalytic coating to be useful under very weak UV light (introduction), and in the experimental section discuss a test which used UV (300-400nm) flux at what appears to be 1.0 mW/cm^2 (or maybe 1.2 mW/cm^2 , the quality of the copy is too poor to be certain), thus overlapping with or numerically insignificantly different from the claimed intensities. While Fukayama et al do not discuss hydrophilicity or water contact angles, these properties would have been inherently present given use of exactly the same materials, in exactly the same circumstances as claimed. Note again that atmospheric air contains water, i.e. has humidity, and the introduction specifically discusses use with air and water. That purification is an intended result, does not change the fact that there is no apparent difference between structures produced by Fukayama et al's process, and those of applicant's claims, especially considering that identical material will be expected to have the same physical properties, and the PTO can not measure the contact angles of Fukayama's product.

Optionally, as discussed above in section 7, Hiroshi Okaniwa et al, discusses that photocatalytic metal oxide layer exposed to UV have decreased contact angles as claimed, hence such would also have been expected in Fukayama et al.

14. Other references from the IDS having teachings equivalent to those applied above include Japanese abstracts to Aiyama et al; Murasawa et al (408A); Koura et al; Horiuchi et al;

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Hitachi LTD, Shoji Yokoishi and Kumai Hiroshi et al; as well as the EPO patent to Yamazachi et al and USPN to Kawashiman et al (465).

15. Applicant's arguments filed 2/28/02 and discussed above have been fully considered but they are not persuasive.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to M.L. Padgett whose telephone number is (703) 308-2336. The examiner can normally be reached on Monday-Friday from about 8 am to 4:30 pm.


The fax phone number for the organization where this application or proceeding is assigned is (703) 305-5408 or 872-9310 (official) or 305-6078 (unofficial).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Padgett:mv

April 12, 2002

April 17, 2002



MARIANNE PADGETT
PRIMARY EXAMINER
GROUP 1700